WHAT IS CLAIMED IS:

1. A charge pump for charging a load to a predetermined voltage and maintaining the predetermined voltage on the load, comprising:

one or more voltage multiplier stages coupled to increase a base voltage, and at least one said stage further comprising:

a plurality of configurable capacitors to allow different quantities of charge to be pumped from the stage during a clock cycle.

2. The charge pump of claim 1 wherein at least one voltage multiplier stage comprises a first capacitor and a second capacitor;

said first and second capacitors being enabled in a first mode of operation to provide a first current; and

said first capacitor being enabled and said second capacitor being disabled in a second mode of operation so as to give a lower charge output per clock cycle in said second mode than in said first mode, thereby providing a lower second current in said second mode than in said first mode.

3. The charge pump of claim 2 wherein the first capacitor is selected to provide a current output from the charge pump in the second mode approximately equal to the current required to maintain said predetermined voltage.

4. The charge pump of claim 2 wherein the pump mode changes from the first mode to the second mode when the voltage on the load reaches within a predetermined margin of the predetermined voltage.

5. The charge pump of claim 1 wherein at least one of said capacitors is electrically connected to a driver circuit;

said driver circuit is protected from high voltages coupled through said capacitor by a protection circuit that can restrict the voltage at the output of the driver circuit to within a predetermined range.

6. A charge pump for charging a load to a predetermined voltage and maintaining the voltage on the load, comprising:

a plurality of voltage multiplier stages coupled to increase a base voltage, at least one stage further comprising:

a driver circuit having a switchable first voltage supply to provide current at a first voltage in a first mode of operation and switch off in a second mode of operation;

a regulated second voltage supply to provide a constant second voltage in a second mode of operation; and

wherein said second voltage is selected to provide a current output from the charge pump approximately equal to the current necessary to maintain said predetermined voltage on said load.

7. The charge pump of claim 6 further comprising a clamp regulation circuit to maintain said constant second voltage by regulating the voltage applied to the gate of a clamp transistor so that the drain of said clamp transistor is kept at a second voltage substantially independent of fluctuations in the voltage supplied to the source of the transistor.

8. A charge pump for charging a load to a predetermined voltage and maintaining the voltage on the load, comprising:

a plurality of voltage multiplier stages coupled to increase a base voltage, at least one stage further comprising:

a variable capacitance provided by a plurality of configurable capacitors;

each of said capacitors being electrically connected to a driver circuit;

said driver circuit having a switchable first voltage supply to provide current at a first voltage in a first mode of operation and switch off in a second mode of operation; and

a regulated second voltage supply to provide a constant second voltage in a second mode of operation.

9. A protection circuit for restricting the voltage at a node to protect devices connected to the node comprising a transistor, a driver circuit and a resistor;

said transistor having a source connected to a supply voltage, a drain connected to the node, and a gate connected to the output of the driver through the resistor.

10. The protection circuit of claim 9 wherein said transistor is an N-channel MOSFET.

11. The protection circuit of claim 9 wherein said resistor is selected to reduce the voltage range at the output of the driver circuit to a range selected to prevent damage to the transistors of the driver circuit when a voltage is coupled through the protected node to the gate of the transistor.

12. A charge pump for charging a load to a predetermined voltage and maintaining the voltage on the load, comprising:

a means for increasing voltage from a base voltage to an output voltage by means of a charge pump;

a means for detecting the voltage on the load and returning an electrical signal to the charge pump when the load reaches a predetermined voltage; and

a means for reducing the capacitance used in one or more stages of the charge pump in response to the signal to provide a reduced current output from the charge pump.

13. A method of charging a load to a predetermined voltage and maintaining the voltage on the load by:

increasing voltage from a base voltage to an output voltage by means of a charge pump;

detecting the voltage on the load and returning an electrical signal to the charge pump when the load reaches a predetermined voltage; and

reducing the capacitance used in one or more stages of the charge pump in response to the signal to provide a reduced current output from the charge pump.

14. A method of charging a load to a predetermined voltage and maintaining the voltage on the load by:

increasing voltage from a base voltage to an output voltage by means of a charge pump;

detecting the voltage on the load and returning an electrical signal to the charge pump when the load reaches a predetermined voltage; and

reducing the voltage used in one or more stages of the charge pump in response to the signal to provide a reduced current output from the charge pump.